



中国船级社  
CHINA CLASSIFICATION SOCIETY  
工厂认可证书  
CERTIFICATE OF WORKS APPROVAL

证书编号/Certificate No.  
LD22PWA00001

兹证明本证书所述制造厂具备按照下列标准的要求生产本证书所列产品的能力和条件。

This is to certify that the manufacturer stated in the certificate meets the requirements of the standards listed below and is available with the ability and conditions to produce the products described in the certificate.

制造厂/Manufacturer

Trelleborg Sealing Solutions Rotherham

地址/Address

Bradmarsh Business Park, Rotherham S60 1BX, United Kingdom

产品名称/Product

合成（轴承）材料&#xd;Compound bearing material&#xd;船用轴承材料  
Marine Bearing Material

认可标准/Approval Standard

1. 中国船级社《钢质海船入级规范》(2021)及修改通报第2篇第3章

Chapter 3, Part Three of China Classification Society Rules for Classification of Sea-Going Steel Ships 2021 and its Amendments.

用于/Intended for

船舶与海上设施/Ships and Offshore Installations

产品明细/Product Description

船用轴承材料/Marine Bearing Material (M0001)

名称/Name	属性（值）/Value	单位/Unit
型号/Type	Orkot TLM Marine Orkot TXM Marine	
材料/Material	Thermosetting resin composition reinforced with natural or woven synthetic fibres incorporating solid lubricants	

批准的图纸/Approved Drawings

图纸批准号/ Drawings Approval No. : LD18W00002

产品认可试验报告/ Approval Test Report

试验报告编号/ Test Report No. : JK101/R3316

试验报告日期/ Test Report Date : 1999-09-01

试验单位/ Laboratory: BMT Defence Services Ltd.

证书有效期至/ This Certificate is valid until 2026年04月09日/ Apr. 09,2026

发证机构 中国船级社伦敦办事处  
Issued by CCS London Office

签发日期 2022年04月03日  
Date Apr. 03,2022

本证书根据中国船级社规范和相关规定签发。所有证书页为一个整体，必须同时使用。纸质证书每页均须由本社盖章方为有效，电子证书含数字签名方为有效，本证书复印件无效。任何单位和个人均不应摘录或节选本证书的部分内容。有关方对所持证书的真实性有疑问时，可以向本社检验机构咨询。This Certificate is issued pursuant to the Rules of the Society and related regulation. All pages of the certificate are taken as a whole and are used simultaneously. No paper certificate page is valid without bearing the stamp of the Society, no electronic certificates is valid without the digital signature, and no copied form of the certificate is regarded as valid. Any part of the certificate is not to be extracted or abridged by any unit or individual in any form. Related parties who are doubted about the authenticity of the certificate may inquire of the Society or its offices.



Form No: W01.

联系方式/Contact Us, 见本社官方网站/See official web site of the Society (<http://www.ccs.org.cn>)

UTN:P022-15179695

试验单位地址/ Test Address: 210 Lower Bristol Road, Bath BA2 3DQ, UK

试验报告编号/ Test Report No. : 0101

试验报告日期/ Test Report Date : 2000-11-20

试验单位/ Laboratory: Orkot Composites

试验单位地址/ Test Address: Bradmarsh Business Park, Rotherham, S60 1BX

试验报告编号/ Test Report No. : HRM 97 Audit Test

试验报告日期/ Test Report Date : 2014-05-06

试验单位/ Laboratory: Trelleborg Sealing Solutions Rotherham

试验单位地址/ Test Address: Bradmarsh Business Park, Rotherham, South Yorkshire, UK

试验报告编号/ Test Report No. : Wear13Q

试验报告日期/ Test Report Date : 2008-04-17

试验单位/ Laboratory: Orkot Composites

试验单位地址/ Test Address: Bradmarsh Business Park, Rotherham, S60 1BX

试验报告编号/ Test Report No. : Test for CCS WA

试验报告日期/ Test Report Date : 2011-04-21

试验单位/ Laboratory: Orkot Composites

试验单位地址/ Test Address: Bradmarsh Business Park, Rotherham, S60 1BX

试验报告编号/ Test Report No. : Wear18W

试验报告日期/ Test Report Date : 2010-09-27

试验单位/ Laboratory: Orkot Composites

试验单位地址/ Test Address: Bradmarsh Business Park, Rotherham, S60 1BX

试验报告编号/ Test Report No. : TR0164

试验报告日期/ Test Report Date : 2006-01-30

试验单位/ Laboratory: Orkot Composites

试验单位地址/ Test Address: Bradmarsh Business Park, Rotherham, S60 1BX

试验报告编号/ Test Report No. : 0102

试验报告日期/ Test Report Date : 2000-11-20

试验单位/ Laboratory: Orkot Composites

试验单位地址/ Test Address: Bradmarsh Business Park, Rotherham, S60 1BX

试验报告编号/ Test Report No. : JD113

试验报告日期/ Test Report Date : 1999-11-01

试验单位/ Laboratory: BMT Defence Services Limited

试验单位地址/ Test Address: Ministry of Defence(PE), ME112 Foxhill, Bath

试验报告编号/ Test Report No. : 0103

试验报告日期/ Test Report Date : 2000-11-20

试验单位/ Laboratory: Orkot Composites

试验单位地址/ Test Address: Bradmarsh Business Park, Rotherham, S60 1BX

### 认可后的产品检验方式/Method of Product Inspection after Approval

按规范只认可不进行产品检验的产品/The product approved only in term of the rules: &#xd;  
认可后的产品检验由制造厂按本社批准的产品检验计划进行检验, 经检验合格后由制造厂签发合格证明, 并连同该产品的本社认可证书复印件一并交付用户, 制造厂对产品符合公约、法规、本社规范和本社认可的标准规定负责。&#xd;  
After approval, product inspection should be carried out by the Manufacturer in accordance with the product inspection scheme approved by the Society. Upon satisfactory inspection, and the Quality Certificate issued by the Manufacturer should be provided to the purchaser together with the copy of the approval certificate issued by the Society. The manufacturer should take responsibility for the product being in compliance with the convention, statutory regulation, the Society rules and the standard accepted by the Society.

### 认可保持条件/Maintenance Requirements of Approval

1. 工厂认可后, 如果图纸、技术文件、工艺规程有较大改变, 应征得本社同意。若改变涉及或影响到产品的设计、主要制造材料、关键工艺或产品的特性、特征, 则与特性有关的图纸和技术文件应经过本社审批, 并在检验机构认为必

要时，经本社检验人员到厂进行检查和见证有关试验，其结果应能证实仍符合认可条件。&#xd;

After works approval, if there are any major changes to the drawings, technical documents, specifications, prior consent should be obtained from the survey office of the Society. If the changes involve or affect product design, major construction materials, key workmanship or product characteristics and properties, drawings and technical documents related to properties are to be examined and approved by the Society and, where deemed necessary by the survey office, the surveyor to the Society will go to the manufacturer to inspect or witness relevant tests and the results of the tests should be able to demonstrate compliance with the approval conditions&#xd;

2. 工厂的质量管理体系应保持有效运行，并且与认可时一致。如果质量管理体系发生改变，应经原体系认证机构审核并报本社批准。&#xd;

The quality management system of the factory shall be ensure effective operation, and shall be the same as the situation of approval. If there are any changes to the quality management system, auditing of the original certification organization for quality management system and the society's approval shall be obtained.&#xd;

3. 工厂认可证书获得者应接受本社每年一次的定期审核，定期审核日为认可证书期满之日对应的每一周年日，检查工作应在定期审核日的前后三个月内进行。Those who have obtained the certificate of works approval shall receive periodical audit done by the Society on an annual basis. The date of periodical audit shall be each anniversary date which corresponds to the date of expiry of the relevant certificate and the periodical audit shall be done within a time span of three months before and after the annual surveillance date.&#xd;

4. 在认可证书有效期内，本社检验人员可在未经事先通知的情况下对工厂的产品制造过程进行审核，以验证产品的生产是否符合业经本社批准的图纸和文件。工厂应予以配合。&#xd;

Within the validity of the approval certificate, the surveyor to the Society may pay unannounced audit to the manufacturing process of the product in order to confirm whether it is in compliance with the drawings and documents approved by the Society. The factory should provide an active cooperation and necessary for the surveyor.&#xd;

5. 认可证书有效期内，如果出现可能导致本社暂停或撤消认可的情况，工厂应及时采取有效的纠正措施。&#xd;

Within the validity of the approval certificate, if cases occur that may cause the Society to suspend or withdraw the certificate, the manufacturer should take corrective actions in a prompt and effective manner.

#### 备注/Remarks

本社已审核了产品厂无石棉声明，但本社的审核不免除产品厂按照合同关系向订货方保证产品无石棉的责任。&#xd;  
The declaration of asbestos-free submitted by manufacturer has been reviewed by the Society. However, liability of the manufacturer to guarantee the products are asbestos-free to purchaser under contract will not be exempted.&#xd;

本证书由原型式认可证书 (No. LD18W00002) 换新并替代原证书。&#xd;

This certificate is renewed from and supersedes the previous Type Approval Certificate No. 18W00002.&#xd;

These bearings are to be fitted in accordance with the manufacturer's manual.&#xd;

1. For use as water lubricated stern tube bearing with ratio of length/diameter not less than 2:1.&#xd;

2. For use as non-lubricated rubber bearing against steel, maximum surface pressure:15MPa(Orkot TLM Marine) and 10MPa(Orkot TXM Marine).&#xd;

3. For use as water or oil lubricated bearing against steel, maximum surface pressure:12.5MPa(Orkot TLM Marine) and 20MPa(Orkot TXM Marine).&#xd;

&#xd;

#### 中国船级社伦敦办事处

#### CCS London Office

注：本证书含有附页，共1页

Note: The certificate is attached with additional 1 page(s)

## Material Properties

Properties	Unit	TLM Marine	TXM Marine
<b>Compressive strength</b> Normal to laminate Parallel to laminate	N/mm <sup>2</sup>	300	280
		90	90
<b>Tensile strength</b>	N/mm <sup>2</sup>	60	55
<b>Flexural strength</b>	N/mm <sup>2</sup>	65	65
<b>Elastic modulus</b> Bending Tensile	10 <sup>4</sup> *N/mm <sup>2</sup>	0.19	0.18
		0.32	0.32
<b>Shear strength</b>	N/mm <sup>2</sup>	80	80
<b>Impact strength</b> (ISO 179/1987 Charpy Impact Unnotched) Normal to Laminate	KJ/mm <sup>2</sup>	120	120
<b>Hardness-Rockwell M</b>		90	90
<b>Density</b>	g/cm <sup>3</sup>	1.25	1.25
<b>Swell in water,% of wall thickness</b>	%	<0.1	<0.1
<b>Operating temperature</b> Range for normal use without special precautions Max.operating temperature Min.operating temperature	°C	-30/65	-30/65
		130	130
		-150	-150
<b>Thermal Expansion Coefficient</b> 20-100°C per °C *10 <sup>-5</sup> Normal to laminate Perpendicular to laminate	10 <sup>-5</sup> *°C	9-10	9-10
		5-6	5-6
<b>Sliding Properties</b> Typical coefficient of friction running dry against a corrosion resistant surface such as stainless steel. Bearing pressure 15 MPa		0.13-0.18	0.05-0.10
Note: All the material properties should subject to the manufacturer's latest product datasheet.			